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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,700	01/10/2004	Christine M. Greiser	A3182Q-US-NP	3437

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EXAMINER	
FIDLER, SHELBY LEE	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/755,700	GREISER ET AL.	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-17,19-27 and 29-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-17,19-27 and 29-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 10, 11, 13, 14, 16-24, 26, 27, 29, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoisington (US 5757400) in view of Kanda et al. (US 6502921 B2).

Regarding claims 1 and 11:

Hoisington discloses a drop emitting device comprising:

a linear array (e.g. ink jet array 23 of Fig. 2) of side by side substantially mutually parallel columnar arrays (see Drawing A below) of ink drop generators (ink jets 40, Fig. 3), the linear array extending along an X-axis (Drawing A);

each columnar array comprised of a first sub-column of ink drop generators (sub-column A, Drawing A) that is interleaved with a second sub-column of ink drop generators (sub-column B, Drawing B);

wherein the first sub-columns of ink drop generators are fluidically coupled to a first ink manifold (supply duct 42, Fig. 3); and

wherein the second sub-columns of ink drop generators are fluidically coupled to a second ink manifold (supply duct 43, Fig. 3).

Hoisington does not expressly disclose that the columnar arrays being oblique to the X-axis.

However, Kanda et al. disclose columnar arrays being oblique to the X-axis (e.g. Fig. 6, where the vertical axis reads as the "X-axis").

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize oblique columnar arrays into Hoisington's invention. The motivation for doing so, as taught by Nakamura et al., is to reduce crosstalk and elevate refilling speed (col. 7, lines 22-38).

Regarding claim 2:

Hoisington also discloses that the columnar arrays of drop generators comprise linear arrays of drop generators (sub-columns A and B, Drawing A).

Regarding claims 3, 13, 19, and 29:

Hoisington also discloses that the drop generators comprise piezoelectric drop generators (col. 2, lines 32-38).

Regarding claims 4, 14, 20, and 30:

Hoisington also discloses that the drop generators respectively include an ink pressure chamber (ink pumping chamber 48, Fig. 4), an outlet channel (orifice passage 49, Fig. 4), and a nozzle (orifice 51, Fig. 4).

Regarding claims 5 and 21:

Hoisington also discloses that the first ink manifold (supply duct 42) receives ink of a first color (e.g. that of reservoir 27, col. 3, lines 15-19 and col. 4, lines 9-13), and the second ink manifold (supply duct 43) receives ink of a second color (e.g. that of reservoir 27, col. 3, lines 15-19 and col. 4, lines 9-13).

Regarding claims 6 and 22:

Hoisington also discloses that the first ink manifold and the second ink manifold receive ink of a same color (col. 4, lines 9-13).

Regarding claims 7 and 23:

Hoisington also discloses a plurality of finger manifolds (branches 44 and 45, Fig. 3) wherein each first sub-column of drop generators is fluidically connected to a first finger manifold (sub-columns A connected to branches 44, Drawing A and Fig. 3) and each second sub-column of drop generators is fluidically connected to a second finger manifold (sub-columns B connected to branches 45, Drawing A and Fig. 3).

Regarding claim 8:

Hoisington also discloses a plurality of side by side finger manifolds (branches 44 and 45, Fig. 3), wherein as to each column the first sub-column of drop generators is fluidically connected to a first finger manifold (sub-columns A connected to branches 44, Drawing A and Fig. 3) and the second sub-column of drop generators is fluidically coupled to a second finger manifold (sub-columns B connected to branches 45, Drawing A and Fig. 3) that is adjacent the first finger manifold (Fig. 3).

Regarding claims 10, 16, 26, and 32:

Hoisington as modified by Kanda et al. disclose all the limitations of claims 1, 11, 17, and 27, and **Hoisington also discloses** that the drop generators are implemented in a laminar stack of plates (col. 2, lines 38-40 and col. 4, lines 17-18).

Hoisington does not expressly disclose that the plates are metal.

However, Kanda et al. disclose plates that are metal (col. 4, lines 47-48).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize metal plates into the invention of Hoisington as modified by Kanda et al. The motivation for doing so, as taught by Kanda et al., is to allow for a mechanical pressing process or an electroforming process (col. 4, lines 45-51).

Regarding claim 17:

Hoisington discloses a drop emitting device comprising:

a first linear array (e.g. ink jet array 23 of Fig. 2) of side by side substantially mutually parallel first columnar arrays (see Drawing A) of ink drop generators (ink jets 40, Fig. 3), the first linear array of first columnar arrays of ink drop generators extending along a X-axis (Drawing A);

each first columnar array of ink drop generators comprised of a first linear sub-column of ink drop generators (sub-column A, Drawing A) that is interleaved with a second linear sub-column of ink drop generators (sub-column B, Drawing A);

wherein the first linear sub-column of ink drop generators is fluidically coupled to a first ink manifold (supply duct 42, Fig. 3);

wherein the second linear sub-column of ink drop generators is fluidically coupled to a second ink manifold (supply duct 43, Fig. 3);

a second linear array (e.g. ink jet array 24 of Fig. 2) of side by side substantially mutually parallel second columnar arrays (see Drawing A) of ink drop generators (ink jets 40, Fig. 3), the second linear array of side by side substantially mutually parallel second columnar arrays of ink drop generators extending along the X-axis (Drawing A), and the second linear array of columnar arrays being adjacent the first linear array of first columnar arrays (Fig. 2);

each second columnar array comprised of a third linear sub-column of ink drop generators (sub-column A to array 24, Drawing A) that is interleaved with a fourth linear sub-column of ink drop generators (sub-column B to array 24, Drawing A);

wherein the third linear sub-column of ink drop generators is fluidically coupled to a third ink manifold (supply duct 42 to array 24, Fig. 3); and

wherein the fourth linear sub-column of ink drop generators is fluidically coupled to a fourth ink manifold (supply duct 43 to array 24, Fig. 3).

Hoisington does not expressly disclose that the first columnar arrays are oblique to the X-axis, that the second columnar arrays are oblique to the X-axis, or that the linear arrays are adjacent along a second axis orthogonal to the X-axis.

However, Kanda et al. disclose first columnar arrays that are oblique to the X-axis (e.g. nozzle columns 11 of Fig. 5);

second columnar arrays that are oblique to the X-axis (e.g. nozzle columns 12 of Fig. 5); and

linear arrays that are adjacent along a second axis orthogonal to the X-axis (horizontal axis of Fig. 5);

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize oblique columnar arrays into Hoisington's invention. The motivation for doing so, as taught by Nakamura et al., is to reduce crosstalk and elevate refilling speed (col. 7, lines 22-38).

Regarding claim 18:

Hoisington also discloses that the first columnar arrays of drop generators comprise first linear arrays of drop generators (sub-columns A and B to array 23, Drawing A), and

wherein the second columnar arrays of drop generators comprise second linear arrays of drop generators (sub-columns A and B to array 24, Drawing A).

Regarding claim 24:

Hoisington also discloses a plurality of side by side finger manifolds (branches 44 and 45, Fig. 3), wherein as to each first columnar array the first linear sub-column of drop generators is fluidically connected to a first finger manifold (sub-columns A of array 23 are connected to branches 44, Drawing A and Fig. 3) and the second linear sub-column of drop generators is fluidically coupled to a second finger manifold (sub-columns B of array 23 are connected to branches 45, Drawing A and Fig. 3) that is adjacent the first finger manifold (Fig. 3).

Regarding claim 27:

Hoisington discloses a drop emitting device comprising:

a linear array (e.g. ink jet array 23 of Fig. 2) of side by side substantially mutually parallel columnar arrays (see Drawing A) of ink drop generators (ink jets 40, Fig. 3), the linear array extending along an X-axis (Drawing A);

a second linear array (e.g. ink jet array 24 of Fig. 2) of side by side substantially mutually parallel columnar arrays (see Drawing A) of ink drop generators (ink jets 40, Fig. 3), the second linear array of side by side substantially mutually parallel second columnar arrays of ink drop generators extending along the X-axis (Drawing A); and

the second linear array of columnar arrays being adjacent the first linear array of first columnar arrays (Fig. 2);

wherein each first columnar array is comprised of first and second linear sub-columns of ink drop generators (sub-columns A and B to array 23, Drawing A) that are interleaved with each other (Fig. 3), and each second columnar array is comprised of third and fourth linear sub-

columns of ink drop generators (sub-columns A and B to array 24, Drawing A) that are interleaved with each other (Fig. 3).

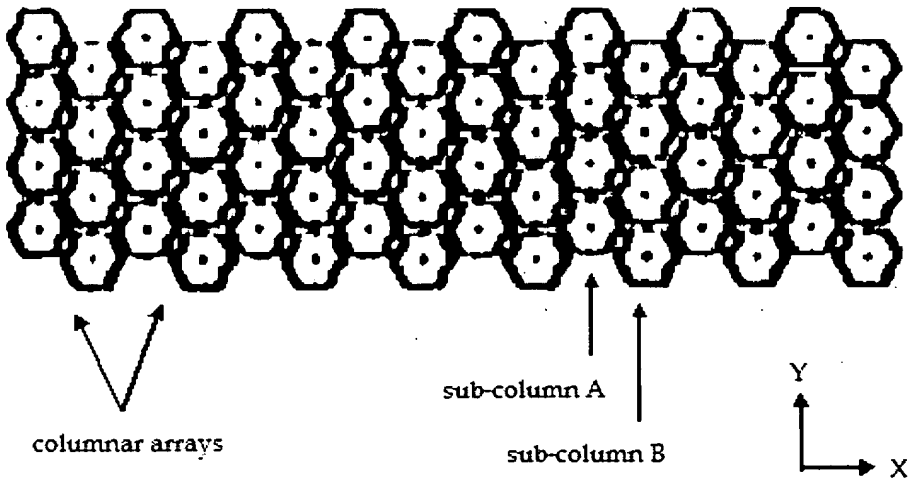
Hoisington does not expressly disclose that the first columnar arrays are oblique to the X-axis, that the second columnar arrays are oblique to the X-axis, or that the linear arrays are adjacent along a second axis orthogonal to the X-axis.

However, Kanda et al. disclose first columnar arrays that are oblique to the X-axis (e.g. nozzle columns 11 of Fig. 5);

second columnar arrays that are oblique to the X-axis (e.g. nozzle columns 12 of Fig. 5); and

linear arrays that are adjacent along a second axis orthogonal to the X-axis (horizontal axis of Fig. 5);

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize oblique columnar arrays into Hoisington's invention. The motivation for doing so, as taught by Nakamura et al., is to reduce crosstalk and elevate refilling speed (col. 7, lines 22-38).



Drawing A: Ink jet array from Fig. 2 of Hoisington, edited for clarification

Claims 9, 15, 25, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoisington (US 5757400) as modified by Kanda et al. (US 6502921 B2), as applied to claims 1 and 11 above, and further in view of Ericksen (US 5079571).

Regarding claims 9, 15, 25, and 31:

Hoisington as modified by Nakamura et al. disclose all claimed limitations except that the drop generators receive melted solid ink.

However, Ericksen discloses drop generators that receive melted solid ink (col. 3, lines 65-67 and Fig. 1).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize melted solid ink into the invention of Hoisington as modified by Kanda et al. The motivation for doing so, as taught by Ericksen, is that the two types of inks are art-recognized equivalents (col. 3, lines 65-67).

Response to Arguments

Applicant's arguments filed 1/10/2004 have been fully considered but they are not persuasive. In response to applicant's argument that the sub columns appear to be from two different columnar arrays, Examiner would like to explain Drawing A. As indicated by the instant claims, a columnar array comprises two interleaved sub columns. As indicated by Drawing A, an ink jet array (23) consists of a plurality of repeated sub-columns (sub-columns A and B) across the X-direction. These sub-columns are paired together to form columnar arrays, which also repeated across the X-direction. Therefore, even though the drawing in question does not expressly indicate each individual sub-column and columnar array, the repetitive nature of the sub-columns and columnar arrays make such indications unnecessary. Also note that the sub-columns A and B offset in the Y-direction, making the ink jets (40) of sub-column A interleave the ink jets of sub-column B. Therefore, the Hoisington reference discloses a linear array of side by side substantially mutually parallel columnar arrays of ink drop generators, wherein each columnar array is comprised of a first sub-column of ink drop generators that is interleaved with a second sub-column of ink drop generators.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until

after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shelby F. Fidler 11/30/06

Shelby Fidler
Patent Examiner
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12/1/06

MANISH S. SHAH
PRIMARY EXAMINER